UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
ALASKA OPERATIONS OFFICE
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March 3, 2015

Reply To: ETPA-083

Mr. Keith Gordon, Project Manager
Regulatory Division
CEPOA-RD
Post Office Box 6898
JBER, AK 99506-0898

RE: Donlin Gold Project Wetland Functional Assessment

Dear Mr. Gordon,

The U.S. Environmental Protection Agency (EPA) has reviewed the draft Wetland Functional Assessment report (FA Report) that was prepared by Three Parameter's Plus, Inc. (3PPI) for the Donlin Gold Project. The FA Report is dated June 2014 and is identified as Version 02, Revision 01. As the U.S. Army Corps of Engineers (Corps) Project Manager coordinating preparation of the Environmental Impact Statement (EIS) for the Donlin Gold Project, you requested comments on the FA Report from the cooperating agencies.

In addition to the FA Report itself, the Corps arranged for 3PPI to provide a presentation on the methodology to the cooperating agencies. This was very helpful. There has also been discussion of a technical working group (TWG) being formed to discuss the functional assessment and allow the agencies to gain greater familiarity with the methodology. The EPA strongly supports convening a TWG. If these comments contain any technical inaccuracies concerning the methodology, we hope our understanding may be corrected during the anticipated TWG discussions.

3PPI has been compiling field data for the Donlin Gold Project since 1996. Over the last eighteen years, they have mapped almost 332,000 acres and generated almost 118,000 individual mapping polygons. The polygons are based on 45 vegetation cover types with recognizable photo signatures. A vegetation type photo signature guide was developed to support the mapping, and is a substantial accomplishment in its own right. The work conducted by 3PPI on this project likely represents the most extensive mapping, wetland delineation, and wetland field data collection effort in support of a private development project to date within the Alaska District.

The EPA is generally supportive of the work performed by 3PPI, and regard it as more rigorous than the majority of functional assessments conducted within the District. That said, it is important to recognize the limitations of this functional assessment. In the interest of brevity, our comments focus on major themes, and are intended to identify potential improvements to the basic methodology that will be both

meaningful and implementable. We can provide additional detailed comments directly to 3PPI, and also hopefully convey them during TWG discussions. In addition, we raise a number of functional assessment issues which are not specific to the FA Report, or even to the Donlin Gold Project, which we hope will foster discussion during the TWG meetings. We place a high priority on developing some level of agency consensus regarding minimal standards for functional assessment so that better direction may be provided to project proponents in the future.

Strengths of 3PPI Approach

The approach utilized by 3PPI to map, delineate, and assess wetland function contains numerous strengths which we believe should become standards within the District. In this context, the term "approach" is inclusive of the function assessment, but is distinct from the specific Magee and Hollands functional assessment "methodology." 3PPI's "approach" could be applied even if a different functional assessment methodology were utilized.

First, the functional assessment is based on field data collection. Some of the field data is qualitative, but the assessment is still based on field measurements and observations. The collection of field data from remote sites is definitely a logistical challenge, and many previous functional assessments have relied upon remote attribution with limited or no field data. By necessity, such attribution of function is qualitative. In addition, many assessments have been based on Best Professional Judgment (BPJ). Though a quantitative, field data-based functional assessment is not necessary for every proposed project, the evaluation of potential impacts should be commensurate with the scale of those impacts. Our position is that projects with the potential for significant impacts, whether measured by acreage or severity, warrant the collection of sufficient field data to support a quantitative functional assessment.

Secondly, 3PPI collected the field data necessary for the functional assessment at the same time they conducted wetland delineation work. This creates obvious efficiencies from not having to return to assessment sites, but it also ensures that the data collection effort includes a soil profile and the characterization of vegetation. It also means that field staff will be on site at the same time during the growing season. Ground-truthing the mapping work, conducting the delineation, and measuring or observing the functional assessment variables reinforce each other when conducted together. Collecting field data for functional assessment should be a required practice if staff will be on site to conduct a delineation.

Third, 3PPI utilizes electronic forms. There are many advantages to this, such as some fields being self-filling, or cross-checking, so that possible errors can be flagged while the team is still on site. In our view, a major advantage is elimination of secondary data entry, which can be a source of error. Maintaining the site data in a database facilitates analysis, including meta-analyses that can help improve our understanding of wetland function over time. We support the District evaluating the feasibility of establishing a database to house wetland field data.

Fourth, the functional attribution is to the project mapping classes, which are the regional plant communities recognizable on aerial imagery. The calculation of the functional capacity indices (FCIs) for each polygon was influenced by the hydrogeomorphic (HGM) class it was assigned, because some of the functional models differ between HGM classes. We discuss this issue in more detail below, but the ability to attribute field data values and therefore function, to recognizable classes is of significant value.

We strongly support the step-wise approach used by 3PPI of wetland mapping, classification, and then assessing/attributing function.

Use of the Magee and Hollands Methodology

There are several elements of the Magee and Hollands methodology that we strongly support. It is a quantitative method in that it generates quantitative FCIs for each of the assessed functions. We believe function-specific, quantitative outputs are of much greater value than qualitative outputs. They can more readily be validated, calibrated, and converted into credits/debits for mitigation analyses. In other assessments, the individual FCIs have been averaged into a single value. 3PPI has utilized average FCI values to generate some summary statistics by ecoregion, HGM class, and vegetation type. This is appropriate, but we appreciate that 3PPI has so far utilized the individual FCIs for the functional profiles they generated as part of their mitigation analyses.

We also support the use of FCIs to calculate functional capacity units (FCUs) by multiplying FCIs by the acreage of the mapped wetland polygon. We believe this should be a standard practice within the District.

We support the extrapolation of functional data to attribute unsampled sites. After grouping sample data by HGM class and vegetation cover type, 3PPI applied the average FCI scores for each function to unsampled polygons with the same combination of HGM class and vegetation cover type. This was a conservative approach that maintains options to enhance the results of the assessment by applying the methods discussed below.

The development of an HGM regional guidebook is time-consuming in that conceptual models are developed for specific HGM classes based on data collected from a set of reference wetlands intended to capture the range of variation within the class. The Magee and Hollands methodology, by comparison, uses literature-derived functional models that may be applied to multiple HGM classes and whose scoring is not calibrated to data from the reference set. This allows wetlands to be assessed without spending the time to develop a regional guidebook.

The use of Magee and Hollands eliminates the need to develop a regional guidebook, but the assessment results are not likely to be as accurate (i.e., implying that the inferences about functional performance are correct) or as precise (i.e., allowing the detection of differences in functional performance between types) as those from a regionally-specific HGM methodology.

Magee and Hollands themselves identified ways to improve the method's outputs. One approach is to develop and validate a regional HGM-based classification rather than use the 'standard' HGM classes. In addition to the five standard HGM classes, 3PPI characterizes wetland polygons by one of the 45 vegetation classes they developed. These vegetation classes may be thought of as HGM regional sub-classes, and the field data from the "sub-classes" should be analyzed to detect significant between-class variation. If the measured and observed values from different HGM/vegetation classes are statistically different, those classes should be used for the assessment.

We are not aware that 3PPI analyzed the 45 vegetation cover classes or the combined HGM/vegetation type "sub-classes" for within- and between-class variation. 3PPI did restrict the extrapolation of functional data from sampled to unsampled wetland polygons within the same HGM/vegetation type

"sub-classes." This may reflect an untested suspicion on their part that the HGM/vegetation type "sub-classes" are more indicative of function than the HGM class alone. Perhaps "indicative of function" would be an overstatement. The "sub-class" would likely have less within-class variation and would allow a more precise extrapolation.

Though 3PPI restricted the functional extrapolation as described above, the association between the project mapping types and the HGM wetland class does not appear to have been analyzed. The EPA supports conducting such an analysis to determine whether certain vegetation classes are coded as being in multiple HGM classes. We also support analyzing data collected within each of the vegetation mapping classes to determine if there are significant differences between the classes.

Use of the HGM Classes

The EPA understands that the original Magee and Hollands methodology uses the standard HGM classes. At the same time, we believe it is important to understand whether use of the HGM classes represents a limitation of the methodology or affects the assessment results in a meaningful way.

The analyses described above; between the 45 vegetation mapping classes, and the association between the HGM classes and the vegetation mapping classes, would indicate whether consolidating multiple mapping classes into the five HGM classes is statistically appropriate. If the analyses indicated that 'lumping' the mapping classes into the five HGM classes results in increased within-class variability and a loss of precision, this would not invalidate the work 3PPI has done. It would simply help to characterize the limitations inherent in the methodology.

Our reviewers flagged the combination of organic and mineral soil flat wetlands into a single HGM "Flats" class as potentially problematic. The combined flats class accounts for over 70% of the wetland acreage evaluated in the Facility Study Area (FSA) and more than 40% of the wetlands evaluated in the Pipeline Study Area (PSA), so it would appear the decision to combine the classes has implications for the assessment. The FA Report describes these wetlands types as functioning similarly, and as being difficult to differentiate. We would welcome additional support for the decision to combine these classes. We find it hard to believe that these classes support the same vegetation cover types, or would have similar values for many of the measured or observed variables (e.g., pH).

As soil profiles are documented at the assessed sites, we wonder why the differentiation between organic and mineral soils would be difficult. If the plant communities supported by organic and mineral soil wetlands are indeed the same, we can understand how determining the soils at an unsampled site may be a challenge, but we believe that NRCS soils mapping exists for at least some of the project assessment area.

Once again, we think that analysis of the data from organic and mineral soil HGM classes would indicate whether combining these data sets may be a problem, and if and to what degree the current FA model output would change if they were treated separately. If that analysis indicates that the organic and mineral soil HGM classes are different, they should be kept separate. Sampled sites would be classed using the six, rather than five, classes. Even if the functional performance of organic and mineral soil flats is shown to be similar, the greater difficulty in restoring organic soil wetlands is worth considering from a mitigation standpoint. This consideration alone may warrant keeping the two flats classes separate.

If either organic or mineral soil flats consistently score higher for a number of functions, it may be appropriate to extrapolate all unsampled wetlands where the soil type is undetermined as the higher-scoring type.

As mentioned above, the combined flats class is the largest wetland class in both the FSA and PSA. Keeping the two types of flat wetlands separate in the watershed profiles (i.e., the characterization of areas by HGM class) would provide greater detail on the diversity, abundance and overall condition of the wetland classes/mapping types within the two impact areas. The profiles would better summarize the type and degree of loss across wetland classes/mapping types if the flats classes were separate.

Generating Reference Data and Calibrating Scores

The Magee and Hollands method does not require the collection of reference data prior to assessing wetlands because the "range of conditions" listed for each variable is literature-based. The same "range of conditions" is used for all wetland types assessed, which may be characterized as a strength or weakness of the method, depending on one's perspective.

Though not required, the method does allow for a reference set of wetlands to be developed over time as site data is collected. As the data from the reference sites is compiled, new "ranges of conditions" can be developed based on the actual measured and observed conditions for each of the appropriate assessment classes. This allows the assessment to be both regionalized to the wetlands in a particular area, and to assess different wetland classes independently based on their specific functional profile.

Wetlands within the reference set need not be undisturbed, but the within-class variability in values may be lower if the wetlands are undisturbed. This would facilitate the extrapolation of function to unsampled sites. As the majority of wetlands in the FSA and PSA are undisturbed, all of the sampled sites could be included within a reference set(s). Analyzing the between-class variation for each of the variables will indicate when it is appropriate to combine mapping classes into meta-classes, to use the HGM classes or HGM/vegetation type sub-classes, and therefore when it is appropriate to use the same "range of conditions" for different classes.

The scoring of the variables may also be regionalized to strengthen the methodology. If new ranges of conditions are generated, natural breakpoints in the distribution of values may be used for functional increments between zero and one. The scoring of the variables could also be calibrated to the distribution of values within the class, so that high within-class values reflected high scores. The scores can be calibrated to reflect high within-class values even if new ranges of conditions are not developed.

Assessment of Indirect and Temporary Impacts

We appreciate the effort 3PPI has put into assessing indirect and temporary impacts. Such assessments are not always conducted. We do question the validity of some of the assumptions made. For example, 3PPI assumes that vegetation clearing will have limited impacts to micro-topography and vegetation density/diversity. This assumption may prove true for some wetland classes, but is likely not correct for other classes. For example, change in the over story composition may have profound influence on the understory composition within forested wetlands.

3PPI also seems to assume that the functions of wetland polygons not intersected by project components will not be affected. This assumption ignores any surface or groundwater connection between the polygons which may affect the adjacent wetlands and may not be valid. Additional evaluation may be warranted in these cases.

Suite of Functions Assessed

3PPI used the suite of functions from Magee and Hollands. We do not criticize this decision on their part, but wish to raise the issue of identifying the appropriate suite of functions to assess for possible discussion by the TWG. We believe the District could identify a specific and minimum suite of wetland functions to be assessed, and that direction would be of value to project sponsors. This would help to ensure consistency between projects even if the specific assessment method varied. The suite of functions could be tailored to specific regions of the state.

Since there are few assessment methods developed specifically for Alaska, such a discussion would help inform the modification and application of methods developed elsewhere. As mentioned in the FA Report, the Magee and Hollands method was developed for the glaciated northeast and can/should be modified if used in other areas of the country. Given that Alaska's wetlands perform some unique functions (e.g., maintenance of thermal regime) it would be useful for the TWG to identify which functions are important to be considered. Another example is carbon sequestration. This function is not assessed, but is included in the assessment method regionalized for Southeast Alaska by Dr. Paul Adamus.

Though the Magee and Hollands functional suite is similar to other assessment methods, there are differences. For example, sediment removal and nutrient/toxicant removal are often assessed as individual functions, but are here treated as a single function-the modification of water quality. We have no way of knowing if and to what degree the current FA model output might change if they were treated separately. Again, we are not suggesting specific changes to 3PPI's work, but hope the TWG will consider whether it is desirable or possible to attribute additional functions using the existing site data and readily available geographic data.

Assessing the Functions of Streams and Lakes

An additional issue that we hope is addressed by the TWG is the question of how to assess the function of waters other than wetlands. Streams, lakes, and ponds occur in the study areas, but are only accounted for in the project acreage summaries and not assessed for their functional significance or included in the baseline credit analysis.

It is difficult to deal with wetlands without dealing with streams and vice versa. The quantification of impacts to streams and other waters is required under CWA Section 404, but there is not agency consensus on how best to approach this issue. The science of stream assessment is complex, relatively new, and generally geared towards stream restoration.

A potential stream assessment tool for consideration is: A Functions-Based Framework for Developing Reach-Scale Assessments, Stream Restoration Goals and Standard Operating Procedures. http://water.epa.gov/lawsregs/guidance/wetlands/upload/A_Function-Based_Framework-2.pdf

In it, Harman et al. (2012), present a function based framework in an effort to help the restoration community understand how the stream functions, the parameters that can be used to assess those functions, and the order that the functions should be addressed to have a successful project.

The framework, called The Stream Functions Pyramid Framework, illustrates the hierarchy of stream functions and provides a list of function-based parameters and measurement methods that can be used to describe the functions. This document is not a stand-alone stream assessment method or is it all inclusive. The Framework's value in determining mitigation under its proposed debit/credit analysis at a site like Donlin may be limited. However, this framework is something that could be drawn upon and provides an opportunity to begin the discussion of how to quantify stream functions at the Donlin Project Site. The EPA and USFWS supported the development of this tool. The BLM is currently evaluating its use in Alaska.

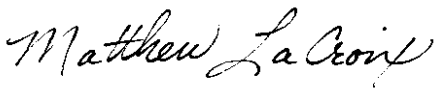
Conclusion

3PPI has prepared a rigorous and extensive FA Report that goes beyond functional assessments typically prepared for projects within the District. That said, we believe there are opportunities to strengthen the assessment outputs. It will be up to the District, hopefully with input from the TWG, to determine whether modifications of the current assessment are warranted.

Regardless of whether the District determines that changes to the wetland assessment are necessary, the issue of stream function must be addressed. Some of the data 3PPI has already collected at stream crossing locations may help support stream assessment, but we suspect that additional data collection will be required. We strongly urge the District to convene a TWG and use that group to help identify a path forward for the stream assessment.

The EPA appreciates the opportunity to comment on the draft Wetland Functional Assessment report prepared for the Donlin Gold Project. We look forward to participation in a TWG, and are prepared to assist the Corps and project proponent in any way we can to address the issues raised in these comments. If you have any questions regarding this letter, please contact me at (907) 271-1480, or by email at lacroix.matthew@epa.gov.

Sincerely,



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